Vegetable Diseases

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Disease control in home vegetable gardens is important if the gardener is to harvest attractive, nutritious vegetables. It is very important that the home gardener use the following tools, if possible, to reduce plant susceptibility to disease: 1.) Use plastic or natural mulch or stake and string vegetables to keep the soil off the harvested portion of the plant. 2.) Use disease-free seed or transplants and choose disease resistant varieties. 3.) Test soil yearly and apply the needed plant nutrients to maintain optimum plant health. 4.) Practice rotation so that the same vegetable or closely related vegetables are not grown in the same location year after year. 5.) Plant in areas with good drainage. 6.) Avoid planting too close together or thin plants in order to allow air movement around the plants. 7.) Control weeds.

If disease occurs it is extremely important to correctly identify the cause of the disease. Removing and destroying diseased portions of the plants may help reduce disease spread. Fungicides can also be used to prevent disease spread as they may help protect the healthy portions of the plants. When using fungicides, it is important that you read and follow the fungicide label. Fungicides listed in the following table are available under many different commercial names and may be found in garden centers or ordered over the Internet. Because different manufacturers' labels vary widely, always check carefully before purchasing a particular brand to make sure it is labeled for both your crop and the disease you are trying to control. For disease problems not covered in the recommendations, contact your local Extension agent or garden center.

Table 2.2 – Fungicide brands available for Home Vegetable Gardens

Chemical Name	Product Name
Captan	American Captan Garden Fungicide Bonide Captan 50W Dragon Captan Wettable Hi-Yield Captan Fungicide 50W Orthocide Garden Fungicide Southern Agricultural Home and Garden Captan Fungicide
Chlorothalonil	Bonide Fung-onil Dragon Daconil 2787 Earl May Fung-onil Ferti-Lome Liquid Fungicide Fung-onil Multipurpose Gordon's Multi-Purpose Fungicide Ortho Daconil 2787 Ortho Garden Disease Control Southern Agricultural Lawn, Ornamental, & Vegetable Fungicide
Basic copper	Acme Bordeaux Mix Bonide Garden Dust Cooke Copper Fungicide Cooke KopRSpray Conc. Dragon Bordeaux Mix Fertilome Bordeaux Mixture Gordon's Bordeaux Mix Hi-Yield Bordeaux Mix Lilly Miller Microcop Fungicide – Basic $CuSO_4$ Southern Agricultural Neutral Copper Fungicide Southern Agricultural Tomato Dust
Fixed copper	American Copper Fungicide Bonide Liquid Copper Fungicide Dragon Copper Fungicide Hi-Yield Copper Fungicide Southern Agricultural Liquid Copper Fungicide
Mancozeb	Bonide Mancozeb Flowable with Zinc Dragon Mancozeb Green Light Broad Spectrum Mancozeb Fungicide Southern Agricultural Dithane M-45
Maneb	Earl May Tomato Blight Control Earl May Tomato and Vegetable Dust Gordon's Maneb Tomato and Vegetable Fungicide Hi-Yield Maneb Garden Fungicide
Neem oil	Green light Powdery Mildew Killer Garden Safe Fungicide 3
PNCB (pentachloro-nitrobenzene)	Hi-Yield Terraclor Granule Southern Agriculture Terraclor
Potassium bicarbonate	Bonide Remedy Cleary First Step
Sulfur	Bonide Liquid Sulfur Bonide Sulfur Fungicide Dragon Garden Sulfur Green Light Wettable Dusting Sulfur Hi-Yield Lime Sulfur Ortho Garden Sulfur Dust Safer Garden Fungicide Southern Agricultural Wettable or Dusting Sulfur

Table 2.3 - Disease Management Tools for Specific Crops and Diseases

Crop Disease	Treatment (PHI)[1]	Rate/Gal. (Unless otherwise Stated)	Remarks
Asparagus Rust	Maneb or Mancozeb	2.0 tbsp	Use resistant varieties or apply 3-4 post- harvest sprays at 7- to 10-day intervals beginning in late June.
Beans (Snaps or Lima) Anthracnose (Lima bean only)	chlorothalonil 12.5% (7)	2.0 tbsp	Begin early bloom – reapply every 7 to 10 days. For use only on beans to be harvested dry with pods removed.
Bacterial Blights	copper	1.5 tbsp powder	Use certified western-grown seed. Begin or 4.0 tsp liquid at tri-foliage and reapply every 7 to 10 days.
Botrytis Blight (Gray mold)	chlorothalonil 12.5% (7) chlorothalonil 30% (7)	4.0 tbsp 1.0 tbsp	Begin at early bloom; apply after extended wet periods.
Downy mildew (Lima beans only)	chlorothalonil 12.5% (7)	2.0 tsp	Begin early bloom – reapply every 7 to 10 days. For use only on beans to be harvested dry with pods removed.
Powdery mildew	neem oil Wettable Sulfur or Sulfur dust	2.0 tbsp 2.5 tbsp or 6.0 tbsp dust	Spray or dust at first sign and reapply every 7 days. Sulfur may injure blossoms and some varieties of beans.
Rhizoctonia root and stem rot	PCNB	4.0 tbsp/gal for 1000 ft row	Apply at planting only. Direct spray in the seed furrow or over the planted row.
Rust	chlorothalonil 12.5% (7) chlorothalonil 30% (7) Wettable Sulfur or Sulfur dust	2.0-4.0 tbsp 1.0 tbsp 2.5 tbsp 6.0 tbsp dust	Spray or dust at first sign and reapply every 7 days. Sulfur may injure blossoms and some varieties of beans.
Seed rot and damping off	Captan	0.5 tsp/1lb seed	Mix thoroughly in paper bag or glass jar.
Viruses	No chemicals registered		Clover control around edge of garden areas is important to reduce spread of virus from clover to beans. Some bean varieties are resistant. Aluminum foil mulch may prevent aphid feeding.
Beets *Cercospora*	copper leaf spot	2.0 tbsp	Spray at 7- to 10-day intervals beginning when disease first appears.
Seed rot and damping off	Captan	2.5 tsp/1 lb seed	Mix thoroughly in paper bag or glass jar.
Cabbage, Broccoli, Brussels Sprout, Cauliflower, Turnips, Kale, Collards Black leg, Black rot	copper	2.0 tbsp	Use western-grown, hot-water treated seed. Use resistant varieties for black rot control. Apply copper at 7- to 10-day intervals. Copper sprays may reduce spread of blackrot.
Club root	PCNB	1.0 tbsp	Apply in transplant water. Use 0.5 pt per plant. Thoroughly mix with the soil.
Downy mildew, *Alternaria* leaf spot	chlorothalonil 12.5% chlorothalonil 30% copper maneb (7)	2.5 tbsp 1.0 tbsp 1.0 tsp 1.0 tbsp	Begin when disease threatens and reapply every 7 days. Do not spray copper when plants are stressed.
Seed rot and damping off	Captan	0.5 tsp/1 lb seed	Mix thoroughly in paper bag or glass jar.

[1]PHI = post-harvest interval and indicates the number of days before harvest that the last fungicide application can be made.

Table 2.3 - Disease Management Tools for Specific Crops and Diseases (cont.)

Crop Disease	Treatment (PHI)[1]	Rate/Gal. (Unless otherwise Stated)	Remarks
Carrots Leaf Blight	chlorothalonil 12.5% chlorothalonil 30% copper	2.5 tbsp 1.0 tbsp 2.0 tbsp	Start applications when disease threatens and reapply every 7 to 10 days if needed.
Celery Bacterial Blight	copper	2.0 tbsp	Apply at first sign of disease; reapply every 7 to10 days.
Cercospora (Early Blight)	chlorothalonil 12.5% (7) chlorothalonil 30% (7) copper	3.0-4.0 tbsp 1.0 tbsp 2.0 tbsp	Apply at first sign of disease; reapply every 7 days.
Septoria (Late blight) or Stalk rot (*Rhizoctonia*)	chlorothalonil 12.5% (7) chlorothalonil 30% (7)	3.0 tbsp 1.0 tbsp	Apply at first sign of disease; reapply every 7 days.
Cucurbits (Cucumbers, Summer Squash, Cantalopes, Pumpkins) *Alternaria* leaf spot; Anthracnose; Downy mildew; Gummy stem blight	chlorothalonil 12.5% chlorothalonil 30% mancozeb (5) maneb (5) copper	2.0-3.0 tbsp 1.0 tbsp 2.0 tbsp 1.0 tbsp 2.0 tbsp	Apply at first sign of disease or after runners are formed and reapply every 7 days. Shorten the spray interval to 5 days if disease pressure is high. Some melon varieties may be sensitive to maneb.
Angular leaf spot (cucumbers only)	copper	1.0-2.0 tbsp	Apply at first sign of disease and reapply every 7 days. Copper may injure some young plants.
Belly rot (*Rhizoctonia*)-suppression only	chlorothalonil 30%	1.0 tbsp	Use mulch to keep fruit off soil surface. For plants in bare soil, begin when plants are in first true leaf stage. Apply during wet soil conditions.
Powdery mildew	chlorothalonil 12.5% chlorothalonil 30% copper neem oil potassium bicarbonate	3.0 tbsp 1.0 tbsp 2.0 tbsp 2.0 tbsp 2.0 tbsp	Begin at first sign of disease. Reapply every 7 days. Shorten interval if disease is severe.
Seed rot and damping off (melons and squash)	Captan	0.5 tsp/1 lb seed	Mix thoroughly in paper bag or glass jar.
Eggplant Anthracnose; fruit rot	maneb (5)	1.0 tbsp	Begin at fruit set. Reapply every 7 days.
Irish Potatoes Early blight, late blight, and *Botrytis* vine rot	chlorothalonil 12.5% chlorothalonil 30% mancozeb (14) maneb (14) copper	2.0 tbsp 1.5 tbsp 2.0 tbsp 1.0 tbsp 2.5 tbsp	Apply at first sign of disease and reapply every 7 days.
Onion Bacterial Soft rot	copper	2.0 tbsp	Apply during extended periods of wet soil. Reapply every 7 days up to harvest.
Onion (dry bulb) *Botrytis* leaf blight, Downy mildew, Purple blotch	chlorothalonil 12.5% (7) chlorothalonil 30% (7) maneb (7)	2.0 tbsp 1.0 tbsp 2.0 tbsp	Apply at first sign of disease and reapply every 7 days. Do not apply to exposed bulbs.
Onion (green bunching), leeks, shallots	chlorothalonil 12.5% (14) chlorothalonil 30% (14) maneb (7) copper	2.0-4.0 tbsp 1.0 tbsp 2.0 tbsp 2.0 tbsp	See above. Do not apply chlorothalonil more than 3 times per season and maneb more than 7 times per season.

[1]PHI = post-harvest interval and indicates the number of days before harvest that the last fungicide application can be made.

Table 2.3 - Disease Management Tools for Specific Crops and Diseases (cont.)

Crop Disease	Treatment (PHI)*	Rate/Gal. (Unless otherwise Stated)	Remarks
Peas Powdery mildew and Bacterial blight	copper neem oil	2.0 tbsp 2.0 tbsp	Apply at first sign of disease and reapply every 7 days up to harvest.
Seed rot and damping off	captan	0.5 tsp/1 lb seed	Mix thoroughly in paper bag or glass jar.
Peppers Anthracnose, fruit rot	maneb (7)	2.0 tbsp	Begin when fruit are half size. Spray on a 7- to 10-day interval.
Bacterial spot and *Cercospora* leaf spot	copper	2.0 tbsp	Apply at first sign of disease and reapply every 7 days up to harvest.
Phytophthora blight	No chemicals registered		Avoid planting in low land. Grow resistant varieties, 'Paladin' or 'Aristotle'.
Southern Blight	PCNB	1.0 tbsp	Apply at transplant. Apply 0.5 pt/plant.
Sweet Corn Bacterial wilt	No chemicals registered		Plant resistant varieties. Spray with approved insecticide to control flea beetles.
Leaf blight, Rust	chlorothalonil 12.5% (14) chlorothalonil 30% (14) mancozeb (7)	1.0-2.5 tbsp 1.0 tbsp 1.5 tbsp	Apply after observing disease and reapply every 7 days.
Tomatoes Early blight, late blight, *Septoria* leaf spot, gray mold, Anthracnose and *Rhizoctonia* fruit rot	chlorothalonil 12.5% chlorothalonil 30% mancozeb (5) maneb (5) copper	3.0-4.0 tbsp 1.0 tbsp 3.0 tbsp 2.0 tbsp 2.0 tbsp	Repeat at 7- to 10-day intervals throughout the season. Under severe conditions shorten spray intervals.
Bacterial spot and speck	copper plus maneb (5)	2.0 tbsp 2.0 tbsp	Apply after observing disease and reapply every 7 days.
Fusarium wilt and *Verticillium* wilt			Use resistant varieties. Maintain soil pH from 6.5-7.0. Rotate out of area.
Southern Blight	PCNB	1.0 tbsp	Apply at transplanting. Apply 0.5 pt/plant
Watermelon Anthracnose, gummy stem blight, *Alternaria* leaf blight, downy mildew and powdery mildew	chlorothalonil 12.5% chlorothalonil 30% mancozeb (5) maneb (5) copper neem oil (powdery mildew)	3.0-4.0 tbsp 1.0 tbsp 2.0 tbsp 2.0 tbsp 2.0 tbsp 2.0 tbsp	Apply at first sign of disease or when runners meet within the row and reapply every 7 days. Shorten interval under severe conditions.

[1]PHI = post-harvest interval and indicates the number of days before harvest that the last fungicide application can be made.

Table 2.4 - Nematode Disease Control in Home Vegetables

Nematode	Remarks
root-knot, root lesion, treatment spiral, sting, lance, and various soil-bourne pathogens	Nematode diseases can cause reduced yield, stunted plants, or weak plants. In areas where nematodes are a problem, rotate with marigolds.